

**REMARKS**

Claims 1, 4-6, and 9-37 were previously pending, of which claims 13-34 have been withdrawn. By this amendment, claim 1 is currently amended, no claims have been added, and no claims have been canceled. As a result, claims 1, 4-6, and 9-37 remain pending, of which claims 1, 4-6, 9-12, and 35-37 are currently under examination. No new matter has been added.

Claim 1 is currently amended to delete “discrete” and to insert “present in a transition metal catalyst:ligand molar ratio of at least 1:1”. Accordingly, claim 1 is currently amended to specify, in part, that the transition metal catalyst and the ligand encapsulated within the permeable polymer microcapsule shell are present in a transition metal catalyst:ligand molar ratio of at least 1:1. Support for the amendment can be found, for example, throughout the Examples section.

**Response to Rejection Under 35 U.S.C. § 112, First Paragraph**

The Examiner rejected claim 1 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. In particular, the Examiner asserted that the recitation “the transition metal catalyst and the ligand are discrete” in claim 1 is not properly described in the application as filed. According to the Examiner, “There is no [sic] any description for the catalyst and ligands as being discrete entities in the micro-encapsulated system.”

Without conceding the merit of the Examiner’s position regarding support for the recitation “the transition metal catalyst and the ligand are discrete” in claim 1, claim 1 is currently amended to delete the term “discrete” and to specify, in part, that “the transition metal catalyst and the ligand encapsulated within the permeable polymer microcapsule shell are present in a transition metal catalyst:ligand molar ratio of at least 1:1.” Applicant respectfully submits that the current amendment to claim 1 renders moot the rejection under 35 U.S.C. § 112, first paragraph. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claim 1 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

Further in connection with the current amendment to claim 1, Applicant wishes to point out that the Examples amply describe embodiments of the claimed microencapsulated catalyst-ligand system in which transition metal catalyst is present in at least equimolar amounts with ligand. In particular, it is evident from Examples 10, 11, 20, 21, and 23 that the transition metal catalyst is present in a 1:1 molar ratio to the ligand; from Example 22, in a 1:0.82 ratio; from Examples 7, 9, 12-17, 19, and 24, in a 2:1 ratio (i.e., 1:0.5); and from Example 8, in a 10:1 ratio (i.e., 1:0.1). The significance of this ratio is that the ligand is present in a sub-stoichiometric amount relative to transition metal catalyst.

In the Declaration under 37 CFR § 1.132 by Mohammed Nisar, filed concurrently with this amendment, the declarant points out that commonly used palladium phosphine complexes, such as tetrakistriphenyl-phosphine palladium and triphenylphosphine palladium chloride, contain phosphine in excess over the transition metal palladium (with Pd/P molar ratios of 1:4 and 1:2, respectively). The declarant also points out that, due to stoichiometry, such conventional complexes cannot predominate in the microcapsules of the Examples.<sup>1</sup>

In contrast, Applicant would like to point out that Wilkinson's catalyst, Rh(I)Cl(PPh<sub>3</sub>)<sub>3</sub>, comprises triphenylphosphine in excess over the transition metal rhodium (with Rh/P molar ratio of 1:3).

Furthermore, the declarant points out that, to the limits of detection using X-ray photoelectron spectroscopy (XPS), palladium in beads prepared in accordance with the Examples of the specification is present in the form of palladium (II) (e.g., as the palladium (II) acetate salt). This form is in contrast to the oxidation state of palladium (i.e., palladium (0)) in the commonly used tetrakistriphenyl-phosphine palladium complex used in catalytic bond-forming reactions.

The significance of this fact includes that at least the vast majority, if not all, of the palladium in the claimed system is present uncomplexed with the ligand, unlike a conventional

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<sup>1</sup> Applicant points out that the description of the preparation of microcapsules in Paragraph 5 of the Declaration by Mr. Nisar corresponds closely to Example 7 of the specification.

metal-ligand complex. (“[T]he palladium in these beads does not appear to be present as a commonly used palladium-phosphine complex”. Declaration at Paragraph 8.)

### **Response to Rejections Under 35 U.S.C. § 102**

Claims 1, 4-6, 9-12, and 35-37 are rejected under 35 U.S.C. § 102(e) as being anticipated by Ley *et al.* (WO 03/006151). More particularly, the Examiner contends that the microencapsulated catalyst disclosed in Ley et al. including Wilkinson’s catalyst anticipates the claims.

Applicant respectfully traverses the rejection in view of the current amendment to claim 1, and for reasons stated above in connection with the Declaration under 37 CFR § 1.132 filed herewith. Briefly, because Let et al. does not teach that the transition metal catalyst and the ligand encapsulated within the permeable polymer microcapsule shell are present in a transition metal catalyst:ligand molar ratio of at least 1:1, Ley et al. does not disclose each and every element of claim 1, as would be required for anticipation. Claims 4-6, 9-12, and 35-37 all depend, directly or indirectly, from claim 1. Accordingly, Ley et al. does not anticipate any of claims 1, 4-6, 9-12, and 35-37.

In view of the above, Applicant respectfully requests the Examiner to reconsider and withdraw the rejection of claims 1, 4-6, 9-12, and 35-37 under 35 U.S.C. § 102(e) as allegedly being anticipated by Ley et al.

**FEES**

The Applicants believe that they have provided for all required fees in connection with the filing of this paper. Nevertheless, the Director is hereby authorized to charge any additional required fee to our Deposit Account, **06-1448**, Reference **HGX-012.01**.

**CONCLUSION**

In light of the foregoing amendments and remarks, it is respectfully submitted that the pending claims are in condition for allowance. Reconsideration and allowance of the pending claims is respectfully solicited. If a telephone interview would be helpful, the Examiner is invited to call the undersigned at 617-832-1000.

Date: December 14, 2010

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